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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/077,654	02/14/2002	Stanley S. Toncich	UTL 00161	5491

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EXAMINER

JONES, STEPHEN E

ART UNIT	PAPER NUMBER
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2817

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/077,654

Applicant(s)

TONCICH, STANLEY S.

Examiner

Stephen E. Jones

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4-6, 9, 10, 13-17 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-6, 9-10, 13-17, and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/24/06 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 2, 4-6, 9-10, 13-17, and 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There does not appear to be any support in the original disclosure of first, second, etc. control signals as is claimed. The original disclosure only appears to support that the ferro-electric component is responsive to a control signal (e.g. see original claim 1).

Any arguments regarding this new matter rejection should include the location in the original disclosure where the subject matter can be found.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 4-6, 9-10, 13-17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernard et al. (US 4,236,125) in view of Nakamichi et al. (EP0909024) and Makino et al. (US 5,945,887) (all of record).

Bernard et al. teaches a circulator including: short circuiting one terminal/port of the device (i.e. forming an isolator) (e.g. see Col. 2, lines 47-50); two other ports (e.g. 41 and 42) are input and output ports; each of the three ports has a tunable matching circuit comprising a portion (e.g. 39) in the signal path and a portion (e.g. 40) connected between the port and ground; inherently the input and output ports are connected to electrical components for the device to be useful; each of the portions of the matching circuits includes a variable capacitor for adjusting the impedance of the respective matching circuit; and the ports of the matching circuits can be designated in an identical manner as the present claims (e.g. port 41 could be considered port 1 of the claim and the input terminal of the isolator on the other end of the matching circuit could be considered port 2).

However, Bernard does not teach that the variable capacitors are ferroelectric tunable capacitors having control signals or that the isolation port circuit includes a resistive element coupled between the first connection point and ground (Claims 1 and 20). Bernard also does not explicitly teach that the input device is a power amplifier (Claim 4) and that the matching circuits naturally match and function as in the claims 13-17 on a substrate.

The Nakamichi et al. reference discloses in figure 1 a ferroelectric variable capacitor (i.e., voltage tunable) {see [0014, 0015, 0018, 0024]} including a control terminal for control signals. As would have been well known, the ferroelectric voltage tunable capacitor offers the advantage over semiconductor varactors of not being susceptible to overheating and burnout as well as having a larger capacitance range.

Makino provides the general teaching of providing a duplexer (i.e. transmit and receive sharing an antenna as shown in Fig. 2), an isolator, matching, and a power amplifier (e.g. see Figs. 1-7). Also, Makino provides the general teaching that 12.5 ohms is a typical impedance value for such circuits and also teaches matching between 2 ohms at an amplifier and 12.5 ohms at the isolator. Makino further shows that a resistor (R) is used to terminate the connection point of the isolated port to ground and a single substrate (50).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have substituted ferroelectric tunable capacitors including control signals

such as taught by Nakamichi et al. in place of the variable capacitors in the isolator circuit of Bernard, because it would have been a mere substitution of art-recognized equivalent variable capacitor means for an RF circuit and would have advantageously provided better overheating/burnout protection and a larger capacitance range.

With respect to the limitations of use of the matching circuits as a power amplifier-to-isolator matching circuit in claim 4 and the mounting on a single substrate (such as Makino Fig. 6 (50)), it should be noted that use of an isolator in a communication device substrate with power amplifiers is well known such as taught by Makino and such a modification would have been obvious based on the desired use.

Regarding Claim 16, it would have been considered obvious to one of ordinary skill in the art to have selected the modified circuit to have the input matching impedance to be 2 ohms at the amplifier output and 12.5 ohms at the isolator input such as taught by Makino (e.g. Fig. 2), because it would have been considered a mere optimization of the impedance/matching of the circuit based on the selection of well-known impedance value amplifiers and isolators such as taught by Makino.

Furthermore, it would have been considered obvious to one of ordinary skill in the art to have selected the output matching circuit to be about 12.5 ohms at the isolator output and 12.5 ohms at the duplexer input, especially since Bernard is silent as to the impedance values and Makino teaches that 12.5 ohms is a typical value, thus it would have been a mere optimization of the impedance matching based on the selected impedance value of the desired choice of duplexer (Claim 14).

Also regarding Claims 13, 15, and 17 as an obvious consequence of the combination resulting in the same structure as the presently claimed structure, the device would function equivalently to the presently claimed invention.

Additionally, it would have been considered obvious to one of ordinary skill in the art to have provided a resistor such as taught by Makino to the modified Bernard device, because it would have provided a well-known means for providing the termination required for forming an isolation port and the advantageous benefit of terminating reflected signals (e.g. see Makino Col. 4, lines 20-25).

Response to Arguments

3. Applicant's arguments filed 11/24/06 have been fully considered but they are not persuasive.

Applicant argues that the matching circuit of Nakamichi substituted into the Bernard or Makino circuit does not arrive at the specific circuit as claimed, and none of the references teach an isolator that is tunable to resonate at an operating frequency using a plurality of control signals.

Applicant's arguments are not persuasive, especially since the rejection includes Nakamichi merely for its variable capacitor means having control signals. The Nakamichi circuit is not being substituted into the Bernard or Makino circuit as applicant argues. Furthermore, Nakamichi provides control signals for controlling the variable capacitances, which would obviously provide the control of the LC matching/resonant circuits for selected frequencies since the capacitance variation varies the resonance in

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an LC circuit (i.e. it is the control signals provided to each variable capacitor of each of the variable LC circuits which provide tunability of the input, output, and isolation port respectively).


Additionally, there does not appear to be any support in the original disclosure of 1st, 2nd, etc. control signals (see the 112 rejection above).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen E. Jones whose telephone number is 571-272-1762. The examiner can normally be reached on Monday through Friday from 9 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert J. Pascal can be reached on 571-272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SEJ


STEPHEN E. JONES
PRIMARY EXAMINER